



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,084	11/20/2003	JINN-KONG SHEU	10722-US-PA	1083

31561 7590 03/19/2008  
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE  
7 FLOOR-1, NO. 100  
ROOSEVELT ROAD, SECTION 2  
TAIPEI, 100  
TAIWAN

EXAMINER
----------

ERDEM, FAZLI

ART UNIT	PAPER NUMBER
----------	--------------

2826

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

03/19/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USA@JCIPGROUP.COM.TW

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/707,084	SHEU ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	FAZLI ERDEM	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-11, 14-17, 19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-11, 14-17, 19 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Even though it has not been used in this rejection, the Examiner would like to point out the Lee et al. (2001/0034116) as relevant art.

#### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02/19/2008 has been entered.

#### ***Information Disclosure Statement***

3. If applicant is aware of any relevant prior art, he/she requested to cite it on form PTO-1449 in accordance with the guidelines set forth in M.P.E.P. 609.

#### ***Drawings***

4. The replacement drawings filed 8/9/2007 remain objected to because the examiner cannot ascertain where the "first protrusion portion" and the "second protrusion portion" are in the figures. From the figures, it looks like the "first protrusion portion" is just the first layer and the second combined of the two layer structure and the "second protrusion portion" is the first layer only.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

Art Unit: 2826

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5, 7-11, 14-17, 19 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant's specification and claims as originally filed do not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed,

had possession of a device having all the limitations of claims 1-5, 7-11, 14-17, 19 and 21 including the formation of Schottky contact between the high resistivity GaN based layer and the electrode with the application of reverse bias between the first and second electrodes.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanamoto (2003/0047744) further in view of Flynn et al. 2005/0167697. Please note that Flynn et al. 2005/0167697 is a publication of a US national stage application of a PCT, said PCT published in English and claiming priority to a provisional US application filed 4/30/02.

Regarding Claim 1, Yanamoto discloses a light emitting device where in Figs. 8 and 10 it is disclosed a substrate 101; a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion, wherein the GaN-based semiconductor layer comprising: a nucleation layer/buffer layer 102, disposed on the substrate 101; an ohmic contact layer 103, disposed on the nucleation layer 102, wherein the ohmic contact layer comprises a second protrusion portion; an active layer 107, disposed on the second protrusion portion, wherein the first protrusion portion is constructed by the second protrusion

portion of the ohmic contact layer and the active layer; a high-resistivity GaN-based interlayer/current strangulation layer 204 for reducing leakage current (for a discussion of how current strangulation layer reduces leakage current please see Yanamoto's related patent application 2003/0047744 included in the 892 Form. Specifically, paragraph 0047 discloses the leakage current reduction), disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising AlInGaN (paragraph 0047) a first electrode 120, disposed on the GaN-based interlayer/current strangulation layer; and a second electrode 121 disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion.

Regarding Claim 2, Yanamoto discloses a first bond-pad (not shown in Fig.) is located on first electrode 120.

Regarding Claim 3, Yanamoto discloses a second bond-pad (not shown in Fig) is located on second electrode 121.

Regarding Claim 4, Yanamoto's disclosed substrate is sapphire (paragraphs 0004 and 0049).

Regarding Claim 5, Yanamoto's disclosed interlayer/current strangulation layer 204 is ion implanted with n-type impurity as shown in paragraph 0047.

Regarding Claim 10, Yanamoto's disclosed electrodes are formed of Ti/Al as shown in paragraph 0086.

Yanamoto fails to disclose the required Schottky contact. However, Flynn et al. disclose a high voltage switching devices where in paragraphs 0118, 0127, Figs. 2A, 6A

10 and in claim 7, Schottky contact is formed between the lowly doped/high resistivity GaN based layer and the contact/electrode.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required Schottky contact structure in Yanamoto as disclosed by Flynn et al. for speed and reliability purposes.

The Schottky contact structure in applicant's claims 1-5 and 10 do not distinguish over the Flynn et al. reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode.

Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*" [emphasis in original]), makes it clear that it is the patentability of the device per se which must be determined in a "functional language" claim and not the patentability of the function, and that an old or obvious device alleged to perform a new function is not patentable as a device, whether claimed in "functional language" terms or not. Note that this caselaw makes clear that in such cases applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed

function], challenging the PTO to prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks") and *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (claiming a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable). See MPEP § 2114.

In *Ex parte Smith*, 83 USPQ2d 1509 (Bd. Pat. App. & Int. 2007, PRECEDENTIAL), the Board found, "There is nothing in the Specification to indicate that the [property] necessary to render the [claimed structure] [capable of the claimed function] is anything more than the inherent result of constructing the [claimed structure] of standard materials in accordance with claim 35's other limitations, which are expressly disclosed in [the prior art]." The Board held, "We thus agree with the Examiner that a prima facie case of anticipation is established by [the prior art]. Because the Appellant presented no evidence to overcome the Examiner's finding of the inherent ability of [the prior art's] [structure] to [perform the claimed function], she failed to meet her burden to overcome that prima facie case. We therefore find that claim 35 is anticipated by [the prior art]." The Board cited *In re King* for the proposition that "[A] prima facie case of anticipation [may be] based on inherency," and *In re Best* for the proposition that "Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product," in support of its holding. See *Ex parte Smith*, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007). Applicant will please



note that the fact one could reasonably expect the prior art to perform the recited function was enough to support a prima facie finding that the device claimed by virtue of the recital of said function was identical to (or obvious in view of, as the case may be) the prior art device.

In this case it is reasonable to assume that Flynn et al.'s device is capable of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode, because a comparison of Applicant's specification to Flynn et al.'s disclosure reveals that Flynn et al. discloses a device having a GaN based semiconductor layer, first electrode, and second electrode that are apparently identical to the GaN based semiconductor layer, first electrode, and second electrode Applicant describes as being capable of performing the function of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode.

Because it is reasonable to assume that assume that Flynn et al.'s device is capable of performing the claimed function, the burden shifts to Applicants to show the contrary. Applicants' burden regarding the functional language used to describe the Schottky contact structure is to produce evidence showing, as a matter of fact, that Flynn et al.'s device is not capable of performing the claimed function. See MPEP § 2114.

7. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanamoto (2003/0047744) in view of Flynn et al. (2005/0167697), as applied to claim 1 above, and further in view of D'Evelyn et al. (2004/0124435).

Yanamoto discloses a light emitting device where in Figs. 8 and 10 it is disclosed a substrate 101; a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion, wherein the GaN-based semiconductor layer comprising: a nucleation layer/buffer layer 102, disposed on the substrate 101; an ohmic contact layer 103, disposed on the nucleation layer 102, wherein the ohmic contact layer comprises a second protrusion portion; an active layer 107, disposed on the second protrusion portion, wherein the first protrusion portion is constructed by the second protrusion portion of the ohmic contact layer and the active layer; a high-resistivity GaN-based interlayer/current strangulation layer 204 for reducing leakage current, (for a discussion of how current strangulation layer reduces leakage current please see Yanamoto's related patent application 2003/0047744 included in the 892 Form. Specifically, paragraph 0047 discloses the leakage current reduction), disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising AlInGaN (paragraph 0047) a first electrode 120, disposed on the GaN-based interlayer/current strangulation layer; and a second electrode 121 disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion. Yanamoto fails to disclose the required type of active/semiconductor, nucleation/buffer and contact/clad/cladding layer of AlInGaN type and the required Schottky contact configuration. However, D'Evelyn et al. disclose a gallium nitride based electronic devices where in paragraphs 0026, 0048 and 0055, AlInGaN based semiconductor/active, nucleation/buffer and contact/clad layers are disclosed.

Regarding Claim 7, a nucleation layer/buffer layer is disclosed in paragraph 0048 of D'Evelyn et al.

Regarding Claim 8, a contact/clad layer is disclosed in paragraph 0055 of D'Evelyn et al.

Regarding Claim 9, a semiconductor/active layer is disclosed in paragraph 0026 of D'Evelyn et al.

Furthermore, in paragraphs 0118, 0127, Figs. 2A, 6A 10 and in claim 7 of Flynn et al. , disclosed that Schottky contact is formed between the lowly doped/high resistivity GaN based layer and the contact/electrode.

The Schottky contact structure in applicant's claims 7-9 do not distinguish over the Flynn et al. reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode.

Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*" [emphasis in original]), makes it clear that it is the patentability of the device per se which must be determined in a "functional language" claim and not the patentability of the function, and that an old or obvious device alleged to perform a new function is not patentable as a device, whether claimed in "functional language" terms or not. Note that this caselaw

makes clear that in such cases applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed function], challenging the PTO to prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks") and *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (claiming a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable). See MPEP § 2114.

In *Ex parte Smith*, 83 USPQ2d 1509 (Bd. Pat. App. & Int. 2007, PRECEDENTIAL), the Board found, "There is nothing in the Specification to indicate that the [property] necessary to render the [claimed structure] [capable of the claimed function] is anything more than the inherent result of constructing the [claimed structure] of standard materials in accordance with claim 35's other limitations, which are expressly disclosed in [the prior art]." The Board held, "We thus agree with the Examiner that a prima facie case of anticipation is established by [the prior art]. Because the Appellant presented no evidence to overcome the Examiner's finding of the inherent ability of [the prior art's] [structure] to [perform the claimed function], she failed to meet her burden to overcome that prima facie case. We therefore find that claim 35 is anticipated by [the prior art]." The Board cited *In re King* for the proposition that "[A] prima facie case of anticipation [may be] based on inherency," and *In re Best* for the proposition that "Where, as here, the claimed and prior art products are identical or substantially

identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product,” in support of its holding. See *Ex parte Smith*, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007). Applicant will please note that the fact one could reasonably expect the prior art to perform the recited function was enough to support a prima facie finding that the device claimed by virtue of the recital of said function was identical to (or obvious in view of, as the case may be) the prior art device.

In this case it is reasonable to assume that Flynn et al.’s device is capable of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode, because a comparison of Applicant’s specification to Flynn et al.’s disclosure reveals that Flynn et al. discloses a device having a GaN based semiconductor layer, first electrode, and second electrode that are apparently identical to the GaN based semiconductor layer, first electrode, and second electrode Applicant describes as being capable of performing the function of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode.

Because it is reasonable to assume that assume that Flynn et al.’s device is capable of performing the claimed function, the burden shifts to Applicants to show the contrary. Applicants’ burden regarding the functional language used to describe the Schottky contact structure is to produce evidence showing, as a matter of fact, that

Art Unit: 2826

Flynn et al.'s device is not capable of performing the claimed function. See MPEP § 2114.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required active, nucleation, contact layers and the required Schottky contact structure in Yanamoto as taught by D'Evelyn et al. and Flynn et al., respectively, in order to have a ease of manufacture since the current strangulation layer/high resistivity layer of Yanamoto is also AlInGaN based layer and for speed purposes.

8. Claims 11, 14-17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yanamoto (2003/0047744) in view of D'Evelyn et al. (2004/0124435), D'Evelyn et al. (2002/0155634) ,and Flynn et al. (2005/0167697).

Regarding Claim 11, Yanamoto discloses a light emitting device where in Figs. 8 and 10 it is disclosed a substrate 101; a GaN-based semiconductor layer, disposed on the substrate, wherein the GaN-based semiconductor layer comprises a first protrusion portion, wherein the GaN-based semiconductor layer comprising: a nucleation layer/buffer layer 102, disposed on the substrate 101; an ohmic contact layer 103, disposed on the nucleation layer 102, wherein the ohmic contact layer comprises a second protrusion portion; an active layer 107, disposed on the second protrusion portion, wherein the first protrusion portion is constructed by the second protrusion portion of the ohmic contact layer and the active layer; a high-resistivity GaN-based interlayer 204, disposed on the first protrusion portion of the GaN-based semiconductor layer, and a material of the GaN-based interlayer comprising AlInGaN (paragraph 0047)

a first electrode 120, disposed on the GaN-based interlayer/current strangulation layer 204 for reducing leakage current (for a discussion of how current strangulation layer reduces leakage current please see Yanamoto's related patent application 2003/0047744 included in the 892 Form. Specifically, paragraph 0047 discloses the leakage current reduction), and a second electrode 121 disposed on a portion of the GaN-based semiconductor layer except for the first protrusion portion.

Regarding Claim 14, in Yanamoto, first bond-pad (not shown in Fig.) is located on first electrode 120.

Regarding Claim 15, in Yanamoto, second bond-pad (not shown in Fig) is located on second electrode 121.

Regarding Claim 16, in Yanamoto, substrate is sapphire (paragraphs 0004 and 0049).

Regarding Claim 17, in Yanamoto, interlayer/current strangulation layer 204 is ion implanted with n-type impurity as shown in paragraph 0047.

Regarding Claim 21, Yanamoto's electrodes are formed of Ti/Al as shown in paragraph 0086.

D'Evelyn et al. '435 disclose a gallium nitride based electronic devices where in paragraphs 0026, 0048 and 0055, AlInGaN based semiconductor/active nucleation/buffer and contact/clad layers are disclosed. Furthermore, in Fig. 2 of De'Evelyn et al. '634 a photodetector device having interlaced finger shaped electrodes is disclosed. Further, Flynn et al. in paragraphs 0118, 0127, Figs. 2A, 6A 10 discloses a

Schottky contact formed between low-doped/high resistivity GaN based layer and a contact/electrode.

The Schottky contact structure in applicant's claims 11, 14-17, 19, and 21 does not distinguish over the Flynn et al. reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode.

Note that functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) ("[A]pparatus claims cover what a device *is*, not what a device *does*" [emphasis in original]), makes it clear that it is the patentability of the device per se which must be determined in a "functional language" claim and not the patentability of the function, and that an old or obvious device alleged to perform a new function is not patentable as a device, whether claimed in "functional language" terms or not. Note that this caselaw makes clear that in such cases applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that [the cited prior art] does not inherently achieve [the claimed function], challenging the PTO to prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks") and *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977) (claiming a new use, new function or unknown property



which is inherently present in the prior art does not necessarily make the claim patentable). See MPEP § 2114.

In *Ex parte Smith*, 83 USPQ2d 1509 (Bd. Pat. App. & Int. 2007, PRECEDENTIAL), the Board found, “There is nothing in the Specification to indicate that the [property] necessary to render the [claimed structure] [capable of the claimed function] is anything more than the inherent result of constructing the [claimed structure] of standard materials in accordance with claim 35's other limitations, which are expressly disclosed in [the prior art].” The Board held, “We thus agree with the Examiner that a prima facie case of anticipation is established by [the prior art]. Because the Appellant presented no evidence to overcome the Examiner's finding of the inherent ability of [the prior art's] [structure] to [perform the claimed function], she failed to meet her burden to overcome that prima facie case. We therefore find that claim 35 is anticipated by [the prior art].” The Board cited *In re King* for the proposition that “[A] prima facie case of anticipation [may be] based on inherency,” and *In re Best* for the proposition that “Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product,” in support of its holding. See *Ex parte Smith*, 83 USPQ2d 1509, 1514 (Bd. Pat. App. & Int. 2007). Applicant will please note that the fact one could reasonably expect the prior art to perform the recited function was enough to support a prima facie finding that the device claimed by virtue of

the recital of said function was identical to (or obvious in view of, as the case may be) the prior art device.

In this case it is reasonable to assume that Flynn et al.'s device is capable of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode, because a comparison of Applicant's specification to Flynn et al.'s disclosure reveals that Flynn et al. discloses a device having a GaN based semiconductor layer, first electrode, and second electrode that are apparently identical to the GaN based semiconductor layer, first electrode, and second electrode Applicant describes as being capable of performing the function of applying a reversed bias to the GaN based semiconductor layer through the first electrode and the second electrode.

Because it is reasonable to assume that Flynn et al.'s device is capable of performing the claimed function, the burden shifts to Applicants to show the contrary. Applicants' burden regarding the functional language used to describe the Schottky contact structure is to produce evidence showing, as a matter of fact, that Flynn et al.'s device is not capable of performing the claimed function. See MPEP § 2114.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include D'Evelyn et al. '435's AlInGaN based semiconductor/active nucleation/buffer, contact/clad layers interlaced finger shaped electrodes and Flynn et al.'s Schottky contact structure in Yanamoto device, in order to have a semiconductor device with compact size since interlaced finger shaped electrodes

provide an optimum electrode configuration without taking space and for speed purposes.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FAZLI ERDEM whose telephone number is (571)272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FE  
March 10, 2008

**/Thomas L Dickey/  
Primary Examiner  
Art Unit 2826**